THE Thermo-Con CELLULAR CONCRETE SYSTEM

Reg. U. S. Pat. Off.

Higgins
INCORPORATED Reg. U. S. Pat. Off. NEW ORLEANS
Thermo-Con Division

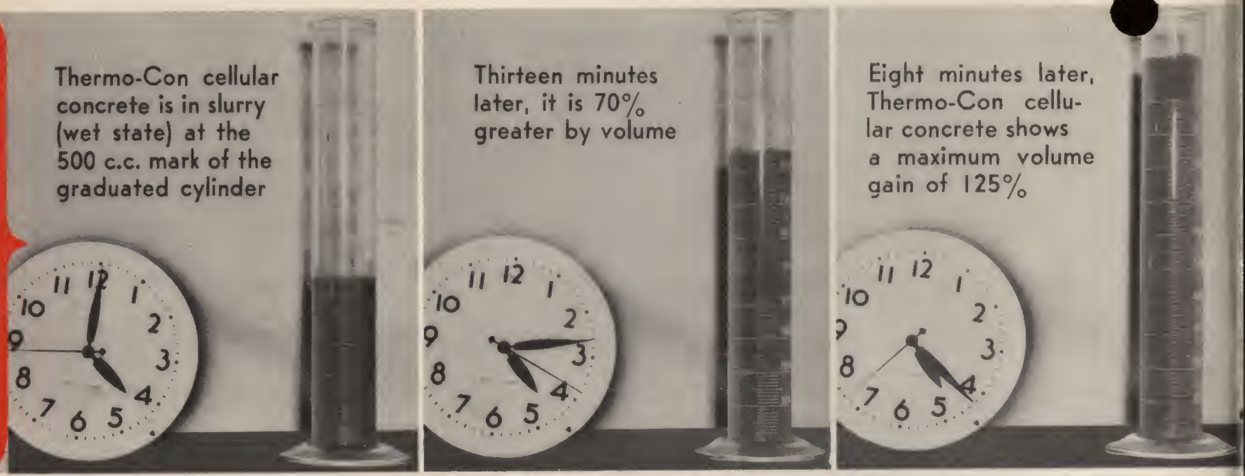
BOOKLET No. 72

Thermo-Con CELLULAR CONCRETE Tested Exhaustively...

The Thermo-Con cellular concrete system is a highly successful method of construction which has been developed over the years by exhaustive tests. It has been proved one of the outstanding building achievements of our era.

This unique building system uses Thermo-Con cellular concrete, which is made from Portland cement, water, and chemicals of mineral origin. These ingredients are mixed in a specially designed generator and pumped into patented forms. The mixture then expands two and one-half times the original volume of the cement to form a cellular concrete with a density of 44-48 lbs. per cu. ft., about one-third the weight of ordinary concrete. However, Thermo-Con cellular concrete has strength properties far beyond those needed for general construction.

Rapid Expansion of the material is seen in the following pictures



Thermo-Con cellular concrete is in slurry (wet state) at the 500 c.c. mark of the graduated cylinder

Thirteen minutes later, it is 70% greater by volume

Eight minutes later, Thermo-Con cellular concrete shows a maximum volume gain of 125%

Report on the Structural Behavior of Thermo-Con Cellular Concrete

By ALBERT KAHN, Associated Architects and Engineers, Inc., Detroit Dec. 1947

"In regard to racking tests, impact tests and transverse loading tests, the Thermo-Con cellular concrete wall proved superior in performance to any other wall tested.

"Whereas, in a test on 8 ft. x 8 ft. wall sections, 62,000 lbs. was required to rack a Thermo-Con cellular concrete wall to failure, clay tile failed at 32,160 lbs. and concrete block wall failed at 25,440 lbs.

"Whereas, a 60 lb. sand bag destroyed the best brick wall, when dropped from a height of 7', 6", and a clay tile and concrete block wall, when dropped from a height of only 1' 6" to 2' 6", Thermo-Con cellular concrete walls could not be destroyed even with a drop of 10 ft. or more.

"Whereas, an equivalent transverse load of from 35 to 75 lbs. per sq. ft. was sufficient to destroy a clay tile and concrete block wall and 130 lbs. per sq. ft. was necessary to bring the very best brick wall to failure, 270 lbs. per sq. ft. was required with a similar test for Thermo-Con cellular concrete walls.

"From the foregoing tests, indicating a superior resistance of Thermo-Con cellular concrete walls against racking, impact and transverse loading, it appears that these walls are especially adapted to locations where those actions occur, in sections of the country subject to earthquake shocks. In the further development of Thermo-Con cellular concrete structures, special attention should be given to this point."

A Truly Remarkable Building Material . . .

Thermo-Con cellular concrete has many properties which make it a superior building material. It is fire-proof, vermin-proof, sound-deadening, and moisture-resistant. It is lightweight, but tremendously strong. It can be sawed like wood, nailed or screwed into.

This amazing material also provides a high degree of insulation against heat or cold. Tests have revealed the great fire-resistant properties and low heat and cold transmission of the material. Thermo-Con cellular concrete was tested at the Underwriters' Laboratories, Inc. (Chicago) and withstood temperatures up to 2300 degrees Fahrenheit.

On the other hand, Thermo-Con cellular concrete cannot and does not receive cold or frost. Tests at private laboratories have proved an extremely low transmission even at 160 degrees below zero. Thus, heating becomes a minor consideration in winter and air conditioning unnecessary in summer where Thermo-Con cellular concrete is used. And yet, with all these advantages, Thermo-Con cellular concrete structures cost less than structures of equally high quality, built of conventional materials.

Not A Pre-Fabricated System . . .

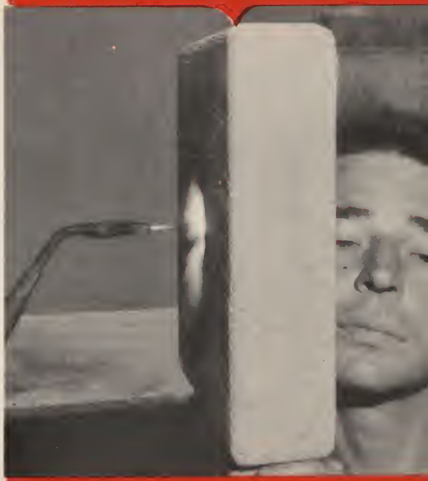
The Thermo-Con cellular concrete system is in no way a pre-fabricated construction method. The forms are designed on a one-foot modular principle and can be arranged to fit any desired plan for a home or commercial building. Any architectural style may be chosen and interior space arranged to suit individual needs. Buildings can be any number of stories.

Readily Available . . .

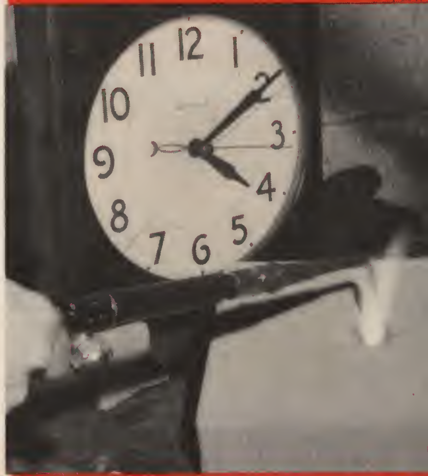
Thermo-Con cellular concrete buildings are available everywhere. For further information, write Higgins Inc., Thermo-Con Division, New Orleans 22, U. S. A.

Concrete Evidence—

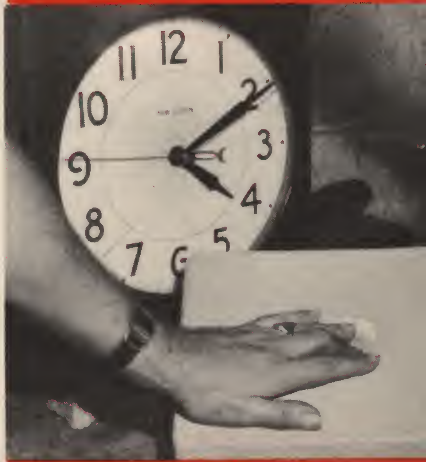
These pictures show how Thermo-Con cellular concrete resists heat.



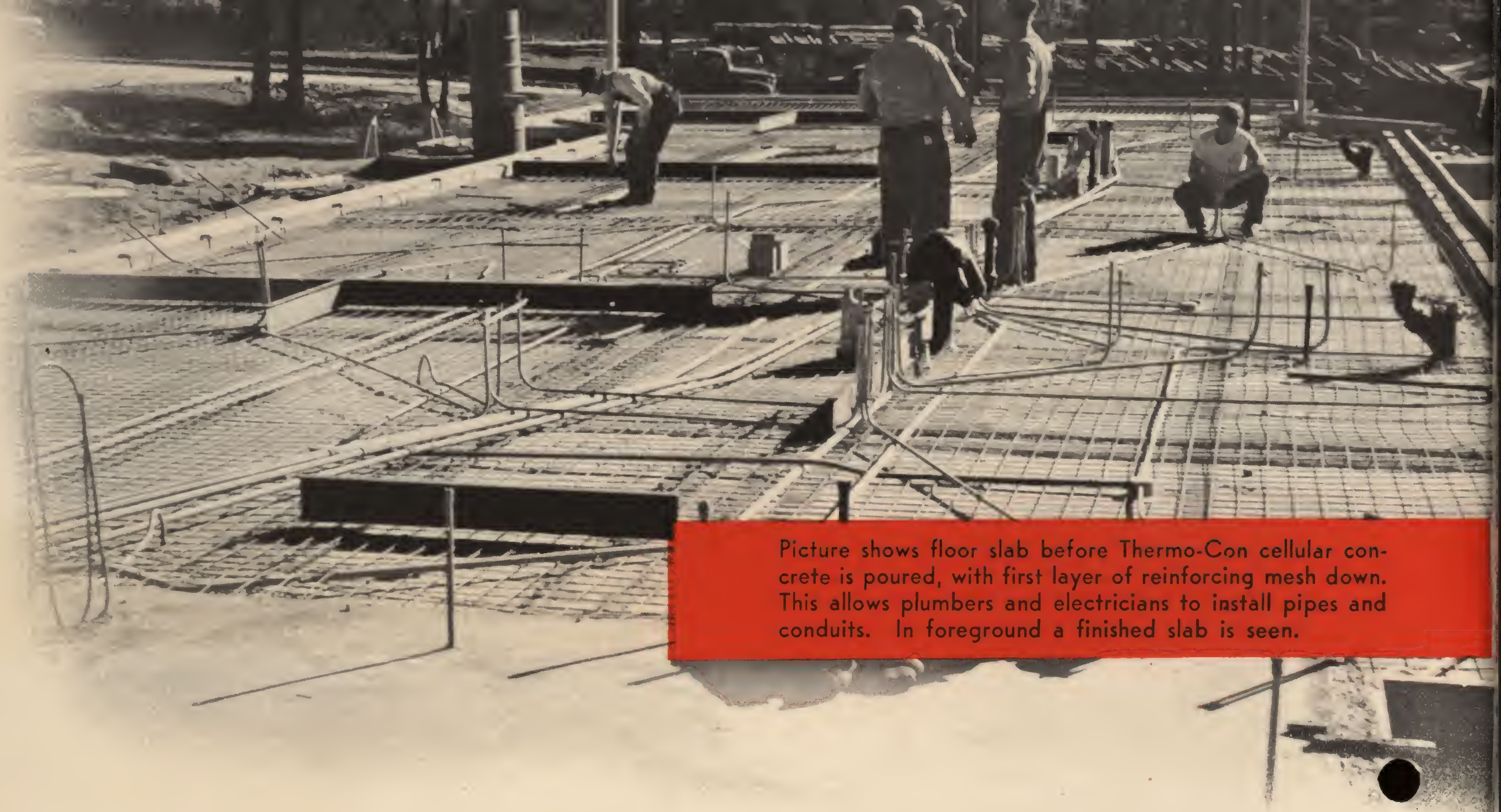
Here a block of the material is used as a shield against high temperatures.



In an Oxy-Acetylene torch test, the flame is held to a block of cellular concrete until a molten puddle is formed at 6000° F.



Twenty-nine seconds later, the puddle has been scraped away and the operator's hand is pressed down into the same space.



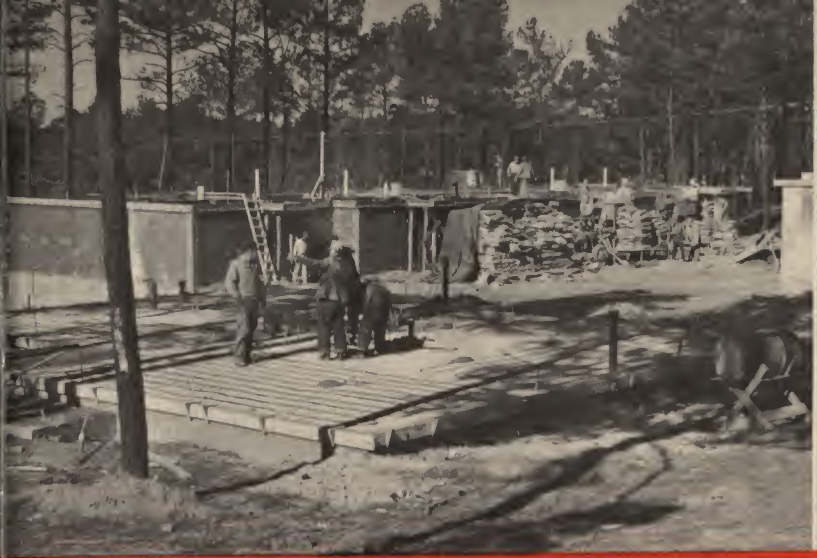
Picture shows floor slab before Thermo-Con cellular concrete is poured, with first layer of reinforcing mesh down. This allows plumbers and electricians to install pipes and conduits. In foreground a finished slab is seen.

How Thermo-Con Cellular Concrete Structures Are Built...

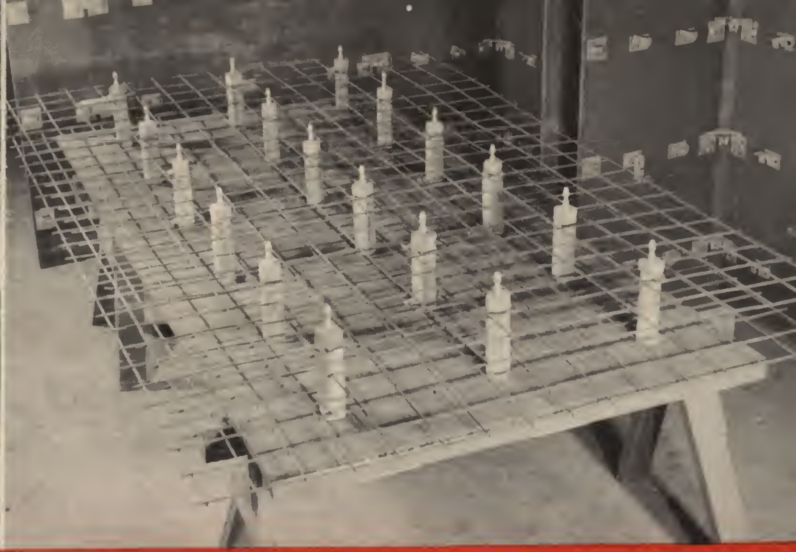
First step is the mixing of Portland cement, water and chemicals. Contractors use a Higgins patented generator which is required to agitate the slurry properly and produce the chemical reaction necessary to expand the material. This generator is a high-production machine which will mix over 800 bags of cement in eight hours (about the quantity used in the average 1000 sq. ft. Thermo-Con cellular concrete house). This mixture is pumped into plastic-faced bonded wood forms, made of multiple plies of hardwood, pressure-joined with waterproof phenolic resins. Forms have spacers and removable pins which hold opposite panels at an equal distance apart. Spacers and pins also secure reinforcing mesh in position one inch from each panel surface.

Floor slabs are laid first. Then wall forms are set up on them according to the plans. These forms allow for window and door frames and keep the latter in position so the wet mix can be cast around them to hold the frames securely in place. Forms are used to cast walls, floor and roof slabs. Slabs are leveled off to receive either finished floor or roofing. Reinforcement for walls, floor and roof slabs is usually only two layers of welded wire steel mesh.

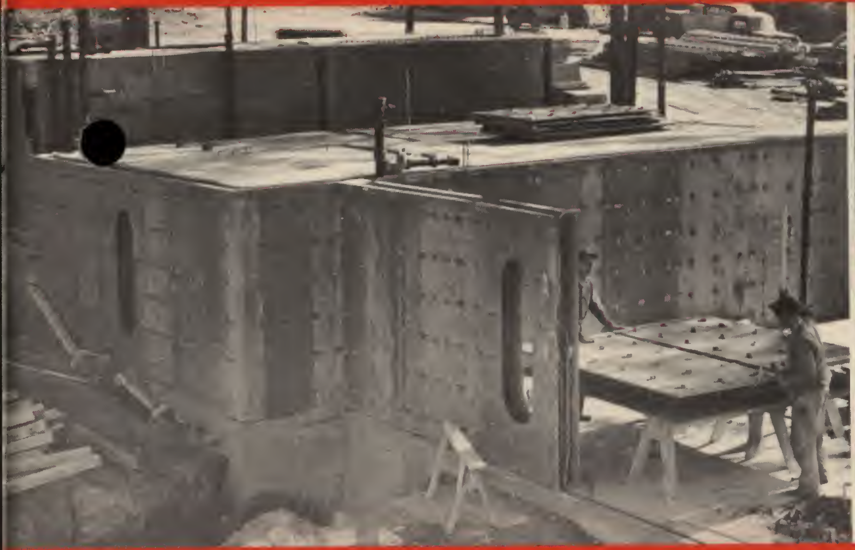
For exterior finishing, Thermo-Seal is recommended. Thermo-Seal is a cement base material which has exceptional waterproofing and weathering qualities. It is mixed with water and up to three parts of fine plasterer's sand by volume. Thermo-Seal is applied with a brush, and any desired texture or finish can be achieved. Interior surfaces can also be finished in the same way, or they can be plastered with skim coat, sand finish or the conventional three-coat method. Thermo-Seal is supplied white and any cement color can be added. Thermo-Seal walls can be painted, either with water-mixed or oil paint. If oil paint is used, walls must be sized.



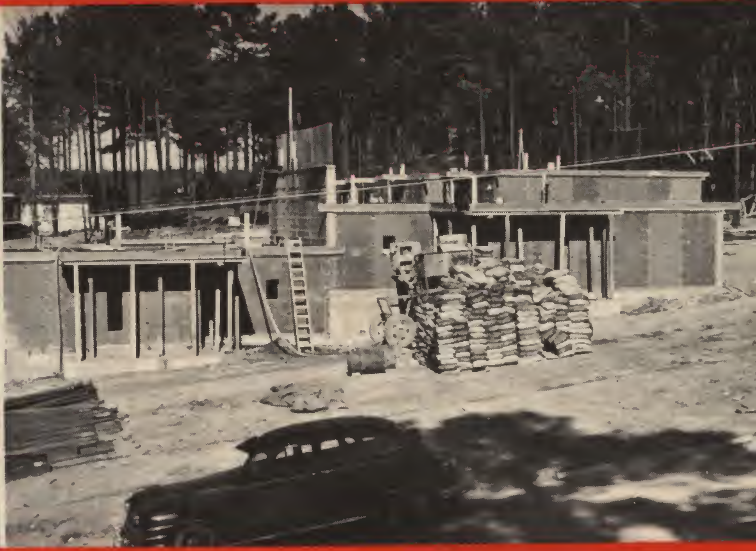
After pouring, plumbers lay radiant floor heating coils, to be covered with one inch of cement topping.



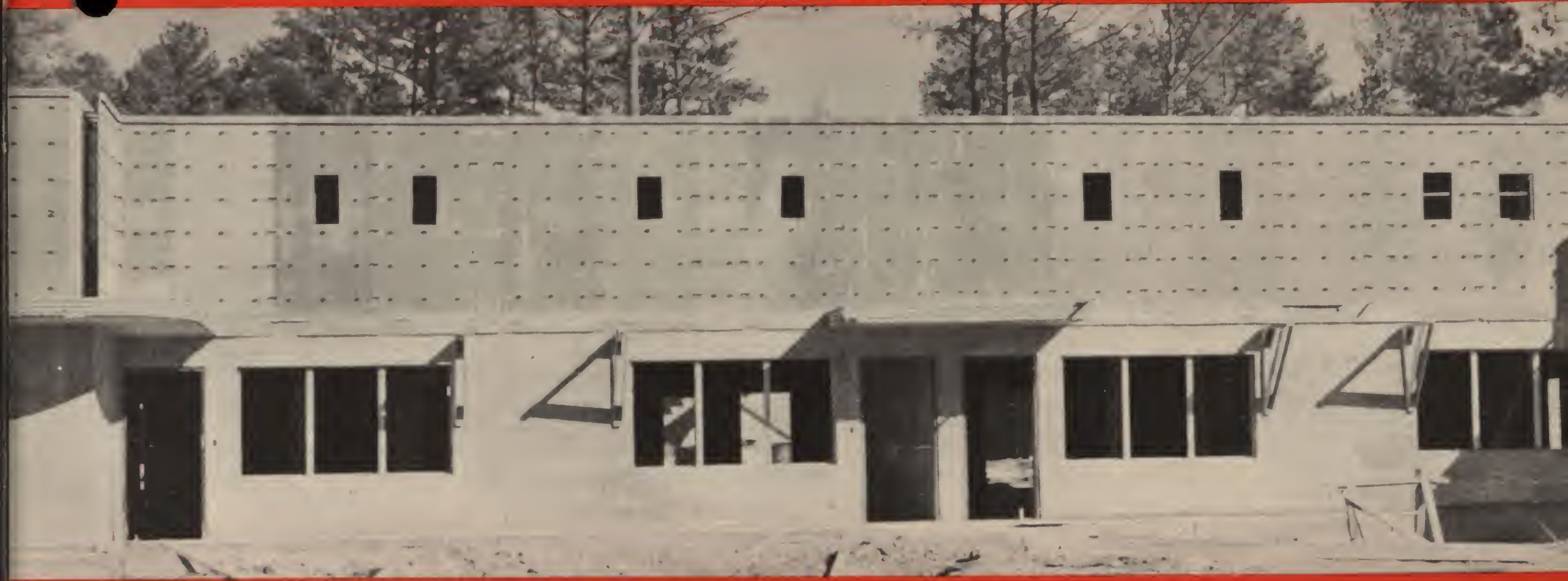
Wall form section is partially assembled, showing reinforcing mesh, clips, spacers and pins.



This picture shows panels being assembled for erection; form panels erected and in place for wall and floor slabs.



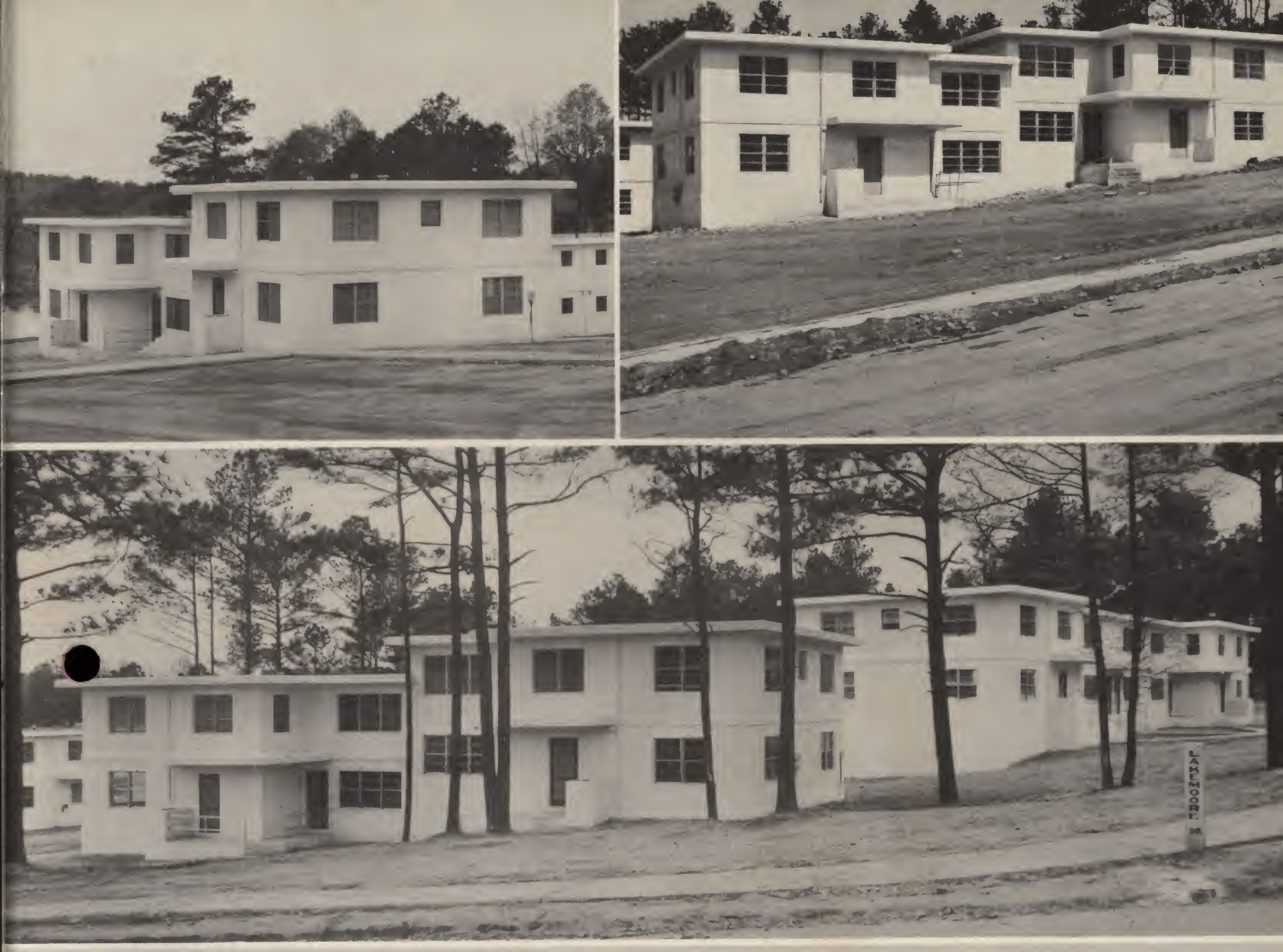
Building is in forming stage. Walls and second floor slabs are being poured. This building has floors on two different levels, which shows flexibility of design allowed by the forms.



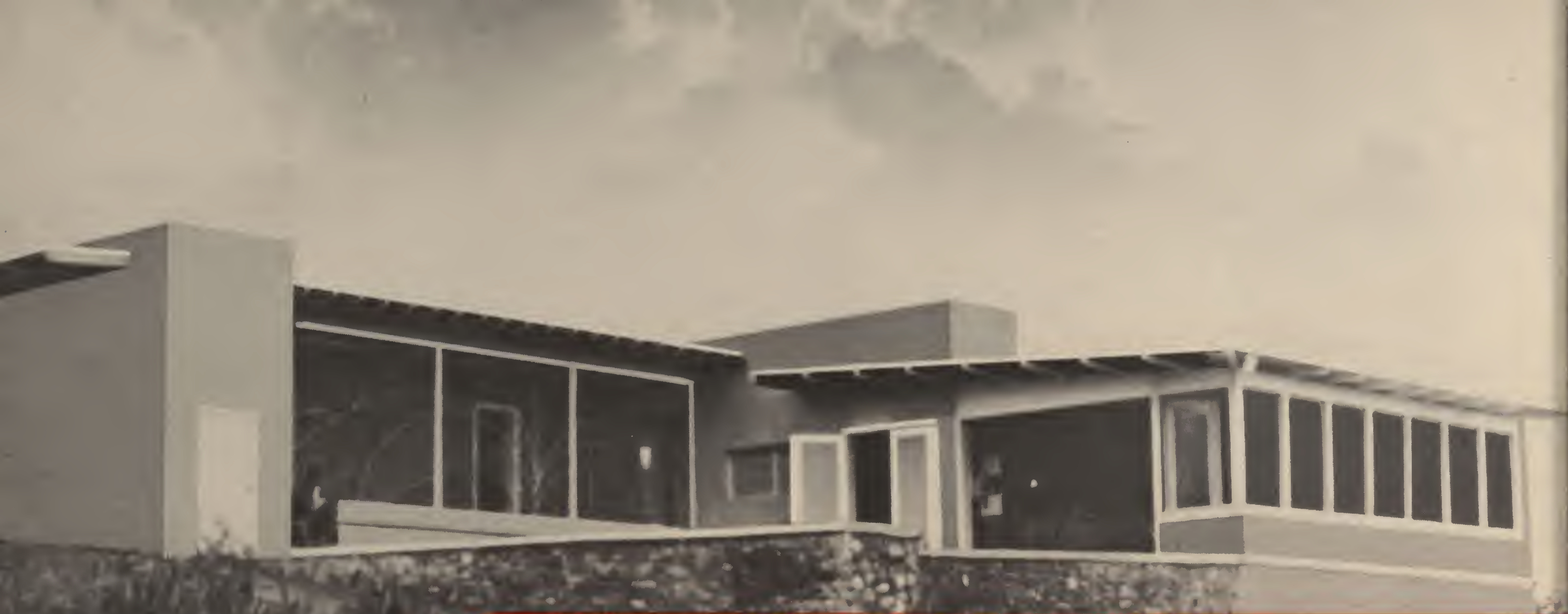
Here is seen the first floor of a building poured and forms stripped off. Second floor is formed, ready for pouring.

The Thermo-Con system fits any type of building—anywhere

Thermo-Con cellular concrete is being widely used throughout North, Central and South America for construction ranging all the way from small homes to commercial buildings and large housing projects.

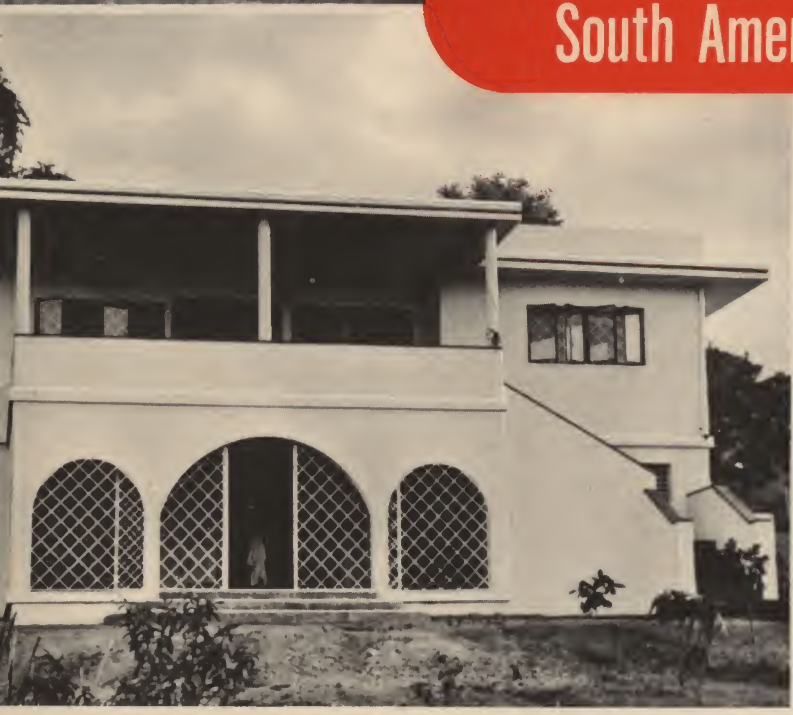


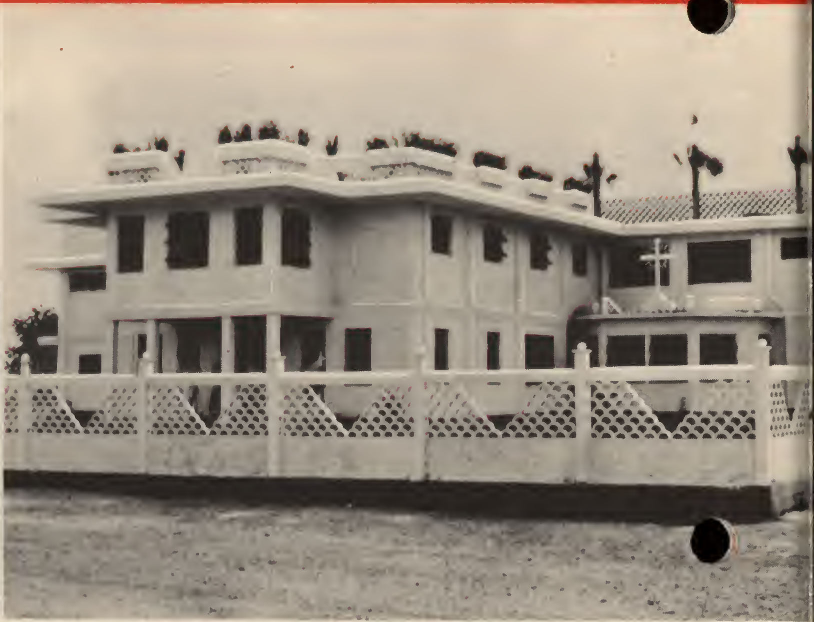
Apartment Project — These pictures are of the recently completed Lakemoore Apartments in Atlanta, Georgia. Twenty-one buildings, housing 104 apartments and 108 garages, cover a large area of suburban Atlanta.

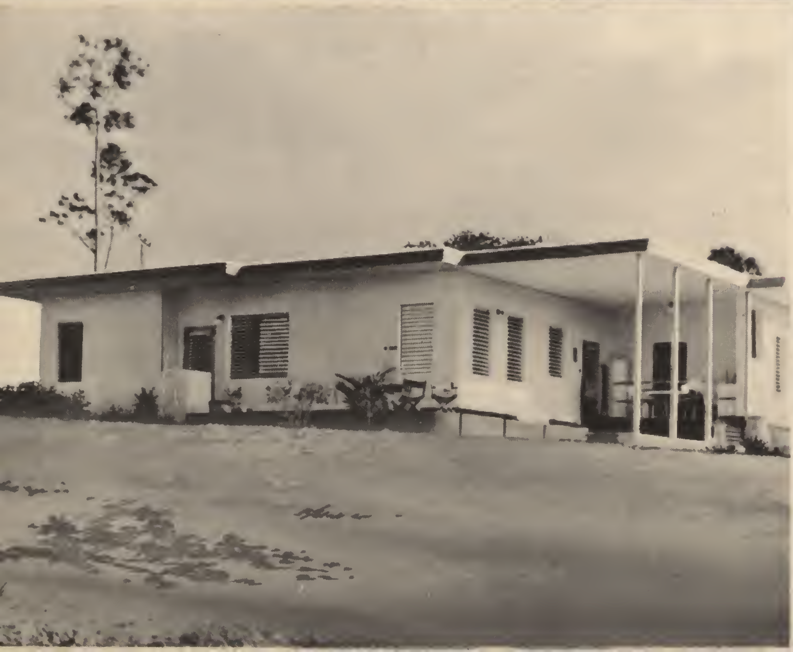


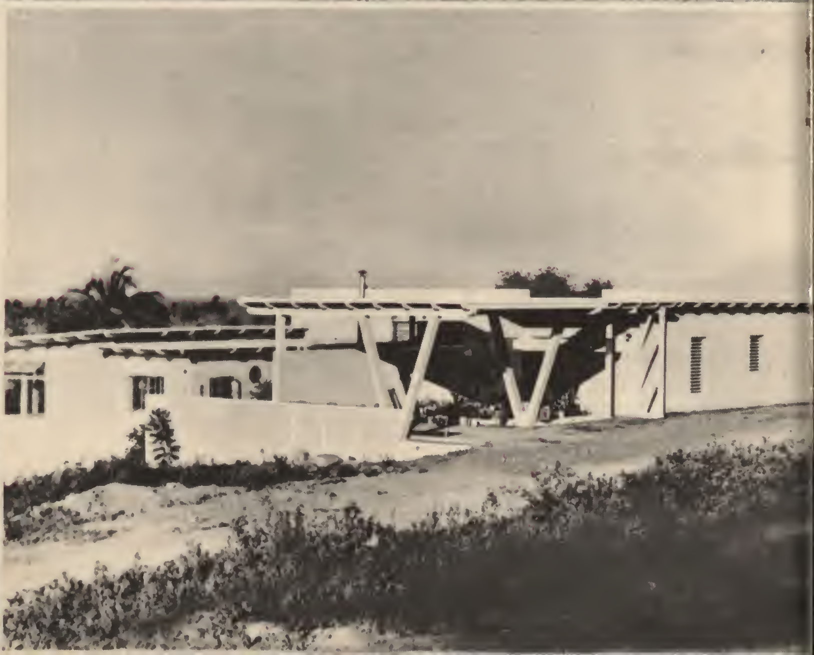
Central and South America —

Here are a few of many homes and other structures built of Thermo-Con cellular concrete in Central and South America. This construction system is popular in these regions because it suits local climatic and topographical conditions.



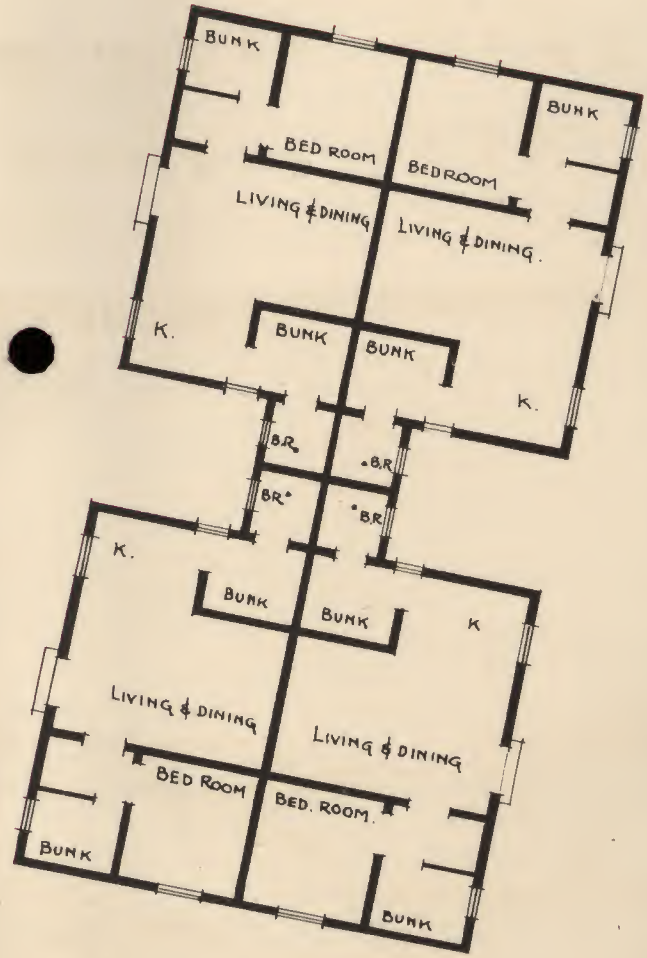






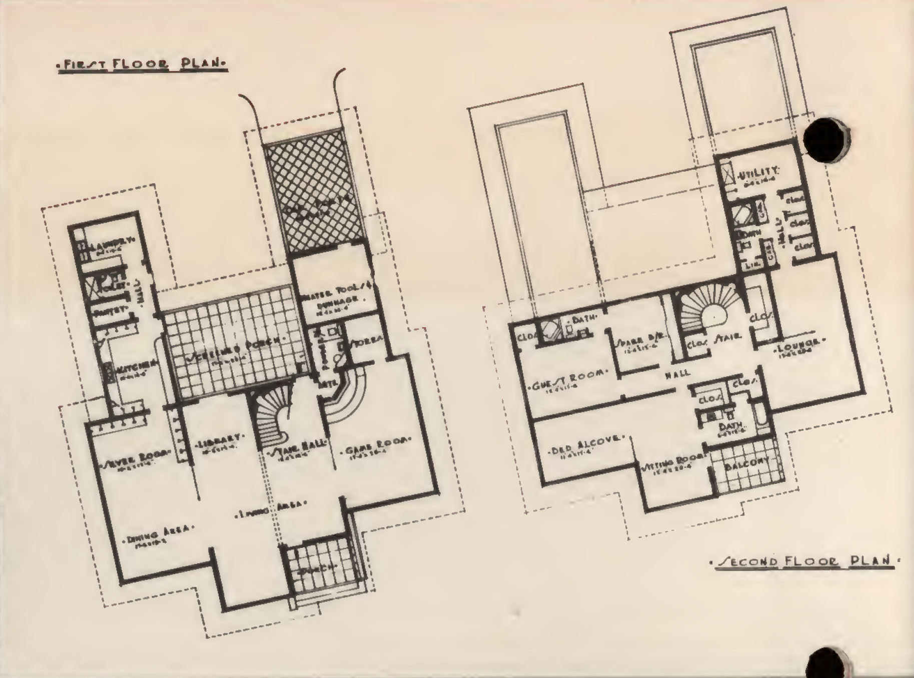
The Caribbean —

Its remarkable insulation against heat and resistance to rot and vermin make Thermo-Con cellular concrete buildings ideal for these housing projects in the Caribbean area.



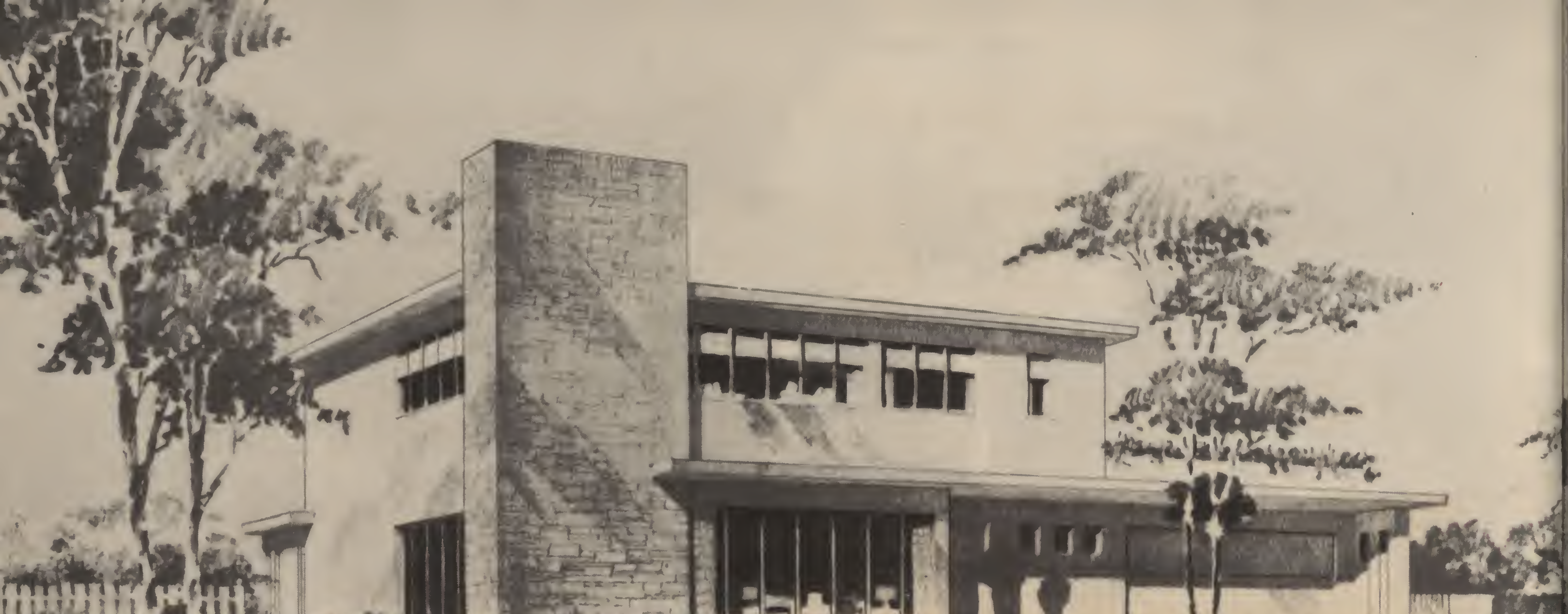
Luxury Homes —

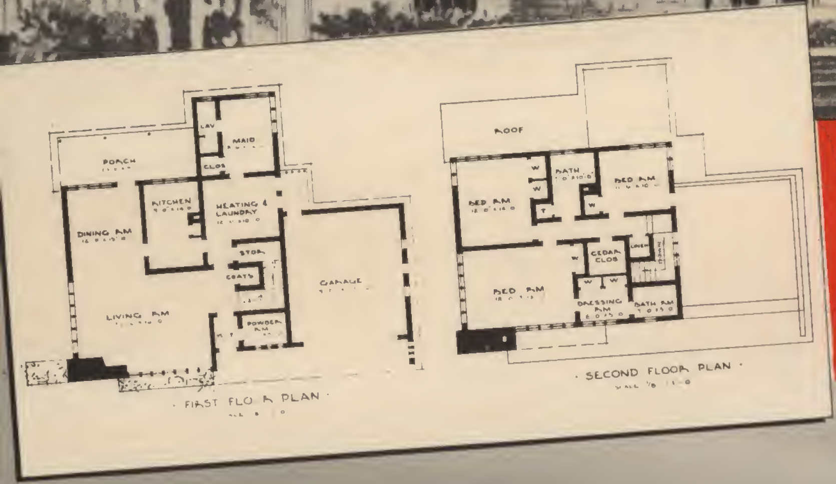
Thermo-Con cellular concrete creates a perfect setting for the comfort and style of gracious modern living. Interiors here illustrate use of conventional plaster over Thermo-Con (upper picture) and of painted Thermo-Seal finish (lower).



Government Projects —

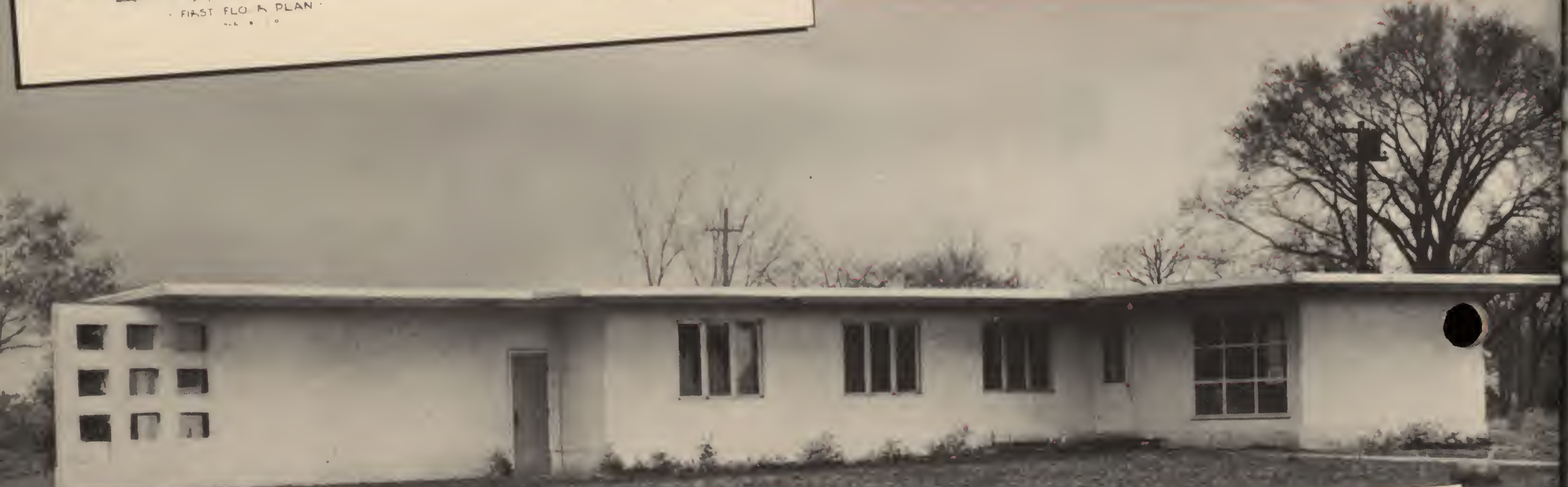
Thermo-Con cellular concrete is being specified more and more for government buildings. Shown here are an Army Officers' Club and a two-story N.C.O. Quarters at the U. S. Engineers Center, Fort Belvoir, Virginia.





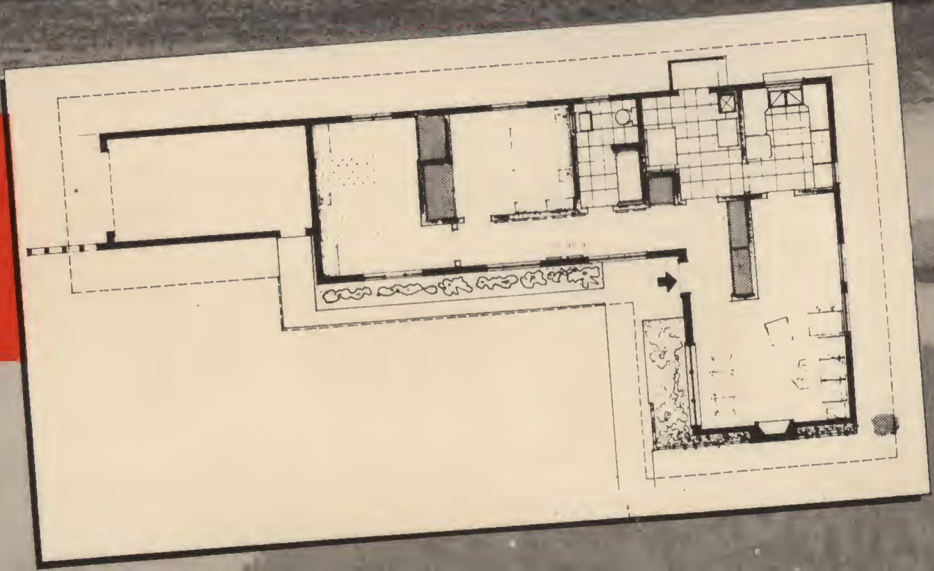
Modern Homes —

This is another example of a fine contemporary home, designed for Thermo-Con cellular concrete.



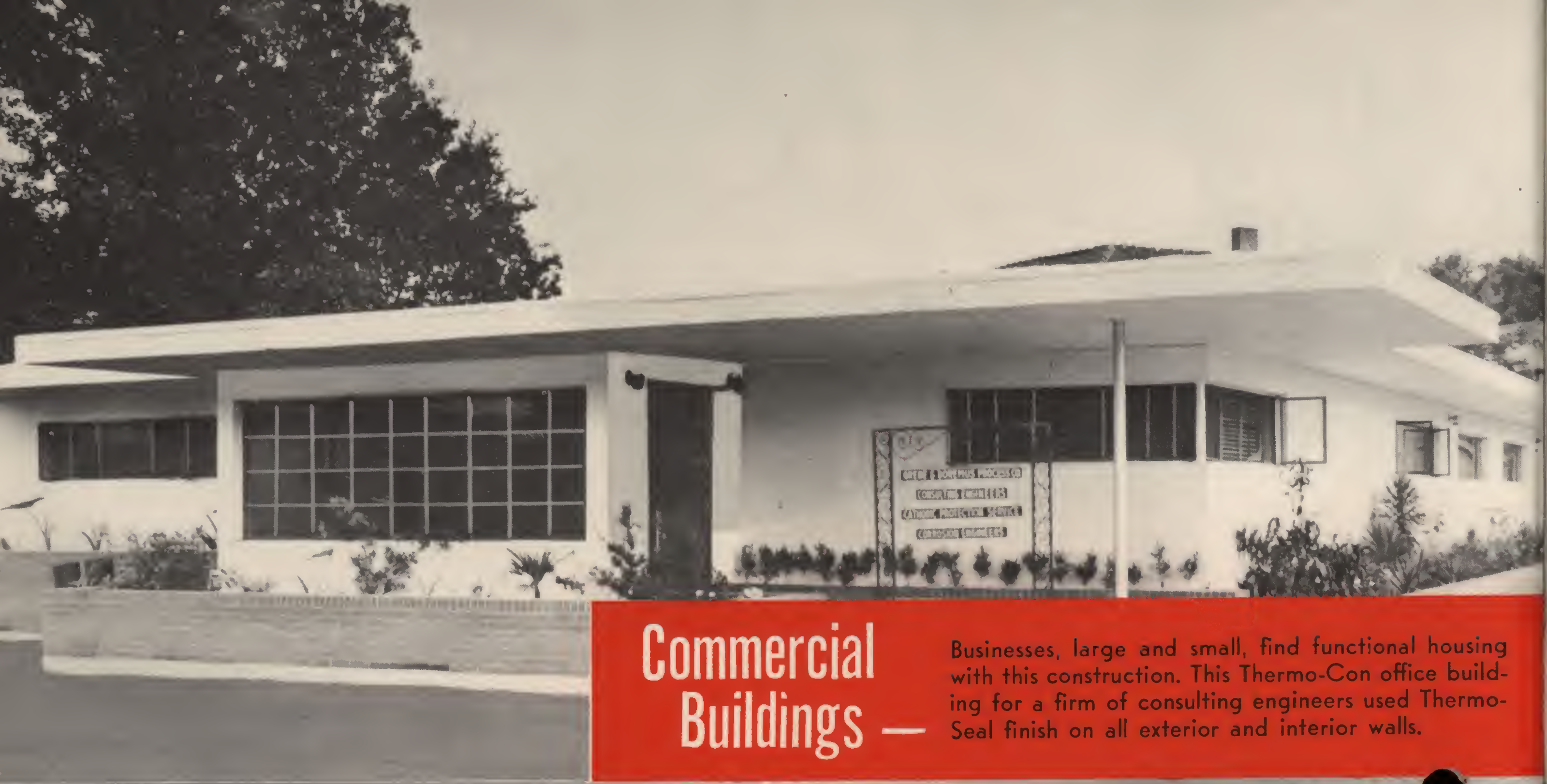
Ranch Types —

Thermo-Con cellular concrete construction is ideal for this increasingly popular architectural style.



Low-Cost Homes —

For small homes where low-cost maintenance, heating and cooling are a "must", Thermo-Con cellular concrete is ideal. These are just a few of the many small U. S. homes which have been built with this material. Note extra living space provided atop the cellular concrete roof.



Commercial Buildings —

Businesses, large and small, find functional housing with this construction. This Thermo-Con office building for a firm of consulting engineers used Thermo-Seal finish on all exterior and interior walls.

Here are a few other commercial applications of Thermo-Con cellular concrete: a modern printing plant, a high-ceilinged, wide-span bus repair garage, and an efficient drive-in restaurant.

The Home of Thermo-Con Cellular Concrete

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Above is the main Higgins office in New Orleans, built in 1944 of Thermo-Con cellular concrete.

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